The need to transport food animals occurs essentially in commercial agriculture and to a lesser extent in the rural or subsistence sector. These animals need to be moved for a number of reasons including marketing, slaughter, re-stocking, from drought areas to better grazing and change of ownership. Typically, methods used to move animals are on hoof, by road motor vehicle, by rail, on ship and by air.

Generally the majority of livestock in developing countries are moved by trekking on the hoof, by road and rail. Historically, livestock has been moved on foot, but with increasing urbanisation of the population and commercialisation of animal production, livestock transport by road and rail vehicles has surpassed this.

Transport of livestock is undoubtedly the most stressful and injurious stage in the chain of operations between farm and slaughterhouse and contributes significantly to poor animal welfare and loss of production.

**Effects of transport**

Poor transportation can have serious deleterious effects on the welfare of livestock and can lead to significant loss of quality and production.

Effects of transport and movement include:

|  |  |
| --- | --- |
| a. Stress | - leading to DFD beef and PSE pork (Fig. 1); |
|  |  |
| b. Bruising | - perhaps the most insidious and significant production waste in the meat industry (Fig. 2, 3); |
|  |  |
| c. Trampling | - this occurs when animals go down due to slippery floors or overcrowding (Fig. 37-39); |
|  |  |
| d. Suffocation | - this usually follows on trampling; |
|  |  |
| e. Heart failure | - occurs mostly in pigs when overfed prior to loading and transportation; |
|  |  |
| f. Heat stroke | - pigs are susceptible to high environment temperatures and humidity; |
|  |  |
| g. Sun burn | - exposure to sun affects pigs seriously; |
|  |  |
| h. Bloat | - restraining ruminants or tying their feet without turning them will cause this; |
|  |  |
| i. Poisoning | - animals can die from plant poisoning during trekking on hoof; |
|  |  |
| j. Predation | - unguarded animals moving on the hoof may be attacked; |
|  |  |
| k. Dehydration | - animals subject to long distance travel without proper watering will suffer weight loss and may die; |
|  |  |
| l. Exhaustion | - may occur for many reasons including heavily pregnant animals or weaklings; |
|  |  |
| m. Injuries | - broken legs, horns (Fig. 4); |
|  |  |
| n. Fighting | - this occurs mostly when a vehicle loaded with pig stops, or amongst horned and polled cattle. |

**Methods of transport**

Cattle

The most appropriate methods of moving cattle are on hoof, by road motor vehicle or by rail wagon. Moving cattle on the hoof (trekking) (Fig. 28) is suitable only where road and rail infrastructure does not exist, or when distances from farm to destination are short. This method is slow and fraught with risks to the welfare and value of the animals. Rail transport is useful for short-haul journeys where loading ramps are available at railheads and communication is direct to destination. Road motor transport is by far the most versatile, the method of first choice and the most user friendly.

The most satisfactory method of transporting cattle is by road motor vehicle (Fig. 29, 30). Moving by rail truck (Fig. 31) requires more careful management and trekking is satisfactory for well-planned distances.

[**Fig. 28: Moving cattle on the hoof**](http://www.fao.org/3/x6909e/x6909e0t.jpg)

[**Fig. 29: Road motor vehicle for transporting cattle (cross slating of cattle truck floor to prevent slipping)**](http://www.fao.org/3/x6909e/x6909e0u.jpg)

[**Fig. 30: Large truck for cattle transport at unloading platform**](http://www.fao.org/3/x6909e/x6909e0v.jpg)

[**Fig. 31: Rail truck for transporting cattle**](http://www.fao.org/3/x6909e/x6909e0w.jpg)

Sheep/goats

Of the food animals these are the easiest to transport and generally travel well on hoof, rail or road. Double-deck trucks are also suitable (Fig. 32).

[**Fig. 32: Double-deck truck for transporting sheep/goats**](http://www.fao.org/3/x6909e/x6909e0x.jpg)

Pigs

Pigs are difficult animals to transport, and the only satisfactory method is by road, although rail can be used under careful circumstances.

Poultry

Broilers and other poultry such as turkeys or ducks are best transported by road. Flocks of birds should be subdivided in small numbers in crates (Fig. 33). Recommended are plastic crates, which can be stacked on top of each other on a vehicle and which can easily be washed after use. The lid of the crates is for loading and the opening at the side for removal of the birds.

[**Fig. 33: Crates for transport of chicken**](http://www.fao.org/3/x6909e/x6909e0y.jpg)

Ostriches

The skin and meat of ostriches is particularly valuable, so careful transport by road vehicle is the only suitable method of transport.

Having selected the preferred method of transport of slaughter animals, it is necessary to take into account numerous factors in order to ensure the health and welfare of the animals.

**Types of vehicles**

Any vehicle used for the transport of slaughter livestock should have adequate ventilation, have a non-slip floor with proper drainage and provide protection from the sun and rain, particularly for pigs. The surfaces of the sides should be smooth and there should be no protrusions or sharp edges. No vehicle should be totally enclosed.

Ventilation-Transport vehicles should never be totally enclosed, as lack of ventilation will cause undue stress and even suffocation, particularly if the weather is hot. Poor ventilation may cause accumulation of exhaust fumes in road vehicles with subsequent poisoning. Pigs are particularly susceptible to excessive heat, poor air circulation, high humidity and respiratory stress. Well-ventilated vehicles are necessary (Fig. 29, 30, 34). The free flow of air at floor level is important to facilitate removal of ammonia from the urine.

[**Fig. 34: Well-ventilated truck for transporting pigs. Heat combined with hot sun would require a cover (roof) for the vehicle.**](http://www.fao.org/3/x6909e/x6909e0z.jpg)

Floors-Non-slip floors in all vehicles are necessary to reduce the risk of animals falling. A grid of cross slating made from wood or metal is (Fig. 29) suitable. The grid can be removable, so the vehicle can be used for other purposes. Other forms of non-slip surfaces such as grass or sawdust are not suitable. Additional balance for animals is provided by partitioning the interior of the vehicle with either wood or metal poles or solid boards. Broken floors will cause leg and other injuries (Fig. 35). Vehicle floors should be level with off-loading platforms (Fig. 16), otherwise animals will injure themselves climbing off or be manhandled in order to remove them (Fig. 36).

Floor space-Livestock require sufficient floor space so that they can stand comfortably without being overcrowded. Overloading results in injuries or even death of livestock (Table 3, Fig. 37, 38, 39).

[**Fig. 35: Cattle leg protruding through broken truck floor**](http://www.fao.org/3/x6909e/x6909e10.jpg)

[**Fig. 36: Poor offloading facilities resulting in injuries from mishandling of animals**](http://www.fao.org/3/x6909e/x6909e11.jpg)

[**Fig. 37: Overloading truck with goats**](http://www.fao.org/3/x6909e/x6909e12.jpg)

[**Fig. 38: Goats being trampled in the back of a truck**](http://www.fao.org/3/x6909e/x6909e13.jpg)

[**Fig. 39: Overloading truck with water buffaloes**](http://www.fao.org/3/x6909e/x6909e14.jpg)

**TABLE 3. Approximate floor space for transporting different classes of animals**

|  |  |  |
| --- | --- | --- |
| **Classes of stock** | | **Floor area/animal (m2)** |
| Mature cattle | | 1.0 - 1.4\* |
| Small calves | | 0.3 |
| Pigs | porker | 0.3 |
| baconer | 0.4 |
| sow/boar | 0.8 |
| Sheep/goats | | 0.4 |
| Ostriches | | 0.8 |

\* 50-60 cm vehicle length/head loaded cross-wise

Allowances should be made for breed and body size. If the floor area is too large for the number of animals, partitions should be used to avoid animals being thrown about.

Sides-The sides of vehicles should be high enough to prevent animals, particularly pigs, from jumping out and injuring themselves. Insides could also be padded at hip level with, for example, old tyres to reduce bruising of cattle and ostriches. Also there should be no gaps through which a leg might protrude and be broken. Narrow entry doors can lead to considerable bruising of hips. Rail trucks should be fitted with spring coupling to cushion jerky movement.

Roof-A roof is not necessary on a transport vehicle for bovines and small ruminants provided the animals are not exposed for hours in the hot sun (Fig. 29, 30). Vehicles for pigs should have roofs unless the pigs are to be transported in the early morning or late evening. Poultry should be protected from sun and rain. Transporting in cages or crates (Fig. 33) will protect them from physical injury. They should be large enough to allow all the birds to sit down and move their heads freely. Ventilation should be adequate.

At the small-scale level in more primitive conditions animals are often transported under very unsuitable conditions, which may cause a great deal of pain or even death through suffocating, heat stress, dehydration etc. (Fig. 40, 41, 42, 71).

[**Fig. 40: Unsuitable transport of a pig in a basket**](http://www.fao.org/3/x6909e/x6909e15.jpg)

[**Fig. 41: Unsuitable transport of ducks on a motorcycle**](http://www.fao.org/3/x6909e/x6909e16.jpg)

[**Fig. 42: Unsuitable transport of chicken on a rickshaw**](http://www.fao.org/3/x6909e/x6909e17.jpg)

**Pre-loading precautions**

There are a number of simple procedures that can be implemented prior to the loading of livestock, which will considerably reduce the risk of injury and stress.

1. Pre-mixing of cattle or pigs leads to greater familiarity and these animals travel better than animals that are strangers. Cattle should be mixed in a pen 24 hours before loading. Victimised or wild animals can be weeded out during this period. Fighting amongst pigs that are strangers is common, resulting in skin damage, wounds and stress. Mix pigs from different pens together before loading, smearing pigs with litter or excreta from the same pen so that they smell similar.

2. Most animals can be fed and watered before transporting. This has a settling effect. However pigs should **not** be fed before transport as the feed ferments and the gas causes pressure on the heart in the thoracic cavity, leading to heart failure and death.

3. Do not mix horned and hornless animals in the vehicles as this causes bruising and injury. Different species should also not be mixed - sheep, goats and calves under 6 months can be mixed and individual animals can be transported in a loose sack tied at the animal’s neck. Feet should not be tied, and animals should be turned every 30 minutes or so. Pigs should not travel with other species unless separated by a partition (Fig. 43). Bulls should not be carried together with other stock unless separated by a strong partition.

4. Animals that are diseased, injured, emaciated or heavily pregnant should not be transported, and unfit, heavy, penfed animals should not travel far as they cannot stand up to the rigours of transport.

5. Vehicles should be fitted with a portable ramp to facilitate emergency offloading in case of prolonged breakdowns.

[**Fig. 43: Malpractice of loading pigs, goats and sheep in the same truck**](http://www.fao.org/3/x6909e/x6909e18.jpg)

**Transport operations**

A number of factors must be taken into account during the journey in order that the animals do not suffer, become injured or die.

1. Trekking-Only cattle, sheep and goats can be successfully moved on hoof, and here certain risks are involved. The journey should be planned, paying attention to the distance to be travelled, opportunities for grazing, watering and overnight rest. Animals should be walked during the cooler times of the day and, if moving some distance to a railhead, they should arrive with sufficient time to be rested and watered before loading. The maximum distances that these animals should be trekked depend on various factors such as weather, body condition, age etc., but the distance given in Table 4 should not be exceeded when trekked.

**TABLE 4. Maximum distances for trekking**

|  |  |  |  |
| --- | --- | --- | --- |
| **Species** | **One day journey** | **More than one day** | |
| **First day** | **Subsequent days** |
| Cattle | 30 km | 24 km | 22 km |
| Sheep/goats | 24 km | 24 km | 16 km |

2. Time of the day-High environment temperatures will increase the risk of heat stress and mortality during transportation. It is important to transport animals in vehicles during the cooler mornings and evenings or even at night. This is particularly important for pigs. A combination of high humidity and high environment temperatures is especially deadly to pigs. Heat can rapidly build up to lethal levels in a stationary vehicle. Wetting pigs with water will help keep them cool.

3. Duration of journey2-Where possible, journeys should be short and direct, without any stoppages. If the vehicle stops, pigs will tend to fight. Cattle and sheep/goats should not travel for more than 36 hours and should be offloaded after 24h for feed and water, if the journey is to take longer than that. Pigs should have access to frequent drinks of water during long journeys, particularly in hot and humid conditions.

2 There are recent moves in developed regions, seeking to limit the duration of livestock transports to 8 hours or less.

4. Driving-Vehicles should be driven smoothly, without jerks or sudden stops. Corners should be taken slowly and gently. The second person should be in attendance to spot downer animals so that the vehicle can be stopped and the animal lifted. Train drivers should avoid “fly shunting” of trucks with livestock.

5. Wind chill-Wind blowing on wet animals being transported in cold weather causes a wind chill factor, where the body temperature is considerably reduced, resulting in severe stress or deaths.